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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WARREN M. EWERT,
BRUCE E. KREISCHER, and RONALD D. KNUDSEN

Appeal 2011-001064
Application 10/800,471
Technology Center 1700

Before CHARLES F. WARREN, BEVERLY A. FRANKLIN, and MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 the final rejection of claims 1, 3-6, 10-13, 15-18, 20-31, 35-37, 39, 41-46, and 48-65. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

Appellants' invention is said to be directed to a method of deactivating the catalyst in the effluent of an oligomerization reactor under conditions which prevent or decrease the formation of hydrogen halide acids during downstream processing and thereby prevent or decrease process equipment corrosion caused by such acids (Spec. para. [4]).

Claim 1 is illustrative:

> 1. A process to deactivate a halide-containing olefin oligomerization catalyst system and inhibit or limit the decomposition of the deactivated catalyst system during recovery of an olefin oligomerization product comprising the steps of:
>
> a) forming an intermediate stream by contacting an olefin oligomerization reactor effluent stream which comprises olefin product(s), catalyst system, and heavies with an alcohol that is soluble in any portion of the reactor effluent stream thereby deactivating the catalyst system; and
>
> b) separating the intermediate stream of step (a) into at least one product stream comprising the olefin oligomerization product and at least one heavies stream;
>
> wherein the separation comprises a distillation comprising a reboiler and material passed through the reboiler is maintained below about 190 °C, and
>
> wherein the catalyst system comprises a chromium source, a pyrrole-containing compound and an alkylaluminum compound and wherein the alcohol is added in an amount to effect a mole alcohol to mole aluminum ratio between about 2.5 and about 1.5.

Appellants appeal the following rejection:

Claims 1, 3-6, 10-13, 15-18, 20-31, 35-37, 39, 41-46, and 48-65 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lashier (US 5,689,028 issued Nov. 18, 1997), Araki (US 5,750,816 issued May 12, 1998) or Kreischer (US 6,380,451 B1 issued Apr. 30, 2002).

Appellants argue the claims as a group, focusing on the reboiler temperature limitation common to the subject matter of independent claims 1, 18, 37 and 57 (App. Br. 11-32). We select claims 1 and 18 as representative of the group.

ISSUES

1. Did the Examiner reversibly err in determining that the subject matter of claims 1, 37 and 57 that includes the requirement that "the reboiler is maintained below about 190°C" would have been a matter of routine optimization of the distillation process of Lashier, Araki or Kreischer? We decide this issue in the negative.
2. Did the Examiner reversibly err in finding that Appellants' evidence of non-obviousness is not probative because it is not commensurate in scope with the claimed invention? We decide this issue in the negative.
3. Did the Examiner reversibly err in finding that Lashier, Araki or Kreischer teach by their silence on the water content in alcohol, the step of "contacting an alcohol with an adsorbent capable of adsorbing water" as recited in claim 18? We decide this issue in the affirmative.

FINDINGS OF FACT AND ANALYSES

Issue (1)

Appellants argue that Lashier, Araki or Kreischer fail to teach or suggest temperature at which the material is passed through a distillation reboiler (App. Br. 20-21). Appellants contend that the Examiner's rejection is based on the mistaken understanding of the prior art as teaching that the reaction conditions of Lashier, Araki or Kreischer are the same as the product recovery conditions (*id.* at 21-23). Appellants argue that the applied prior art differentiates between reaction conditions and product recovery conditions. *Id.* Appellants further argue that Araki's exemplification of evaporator temperatures of 200°C and 230°C constitutes a teaching away from Appellants' reboiler temperature of below about 190°C (*id.* at 24-28). Appellants further argue that the Examiner's statement that it appears that Lashier, Araki or Kreischer "most likely" uses the claimed reboiler temperature, as no catalyst decomposition or corrosion of the apparatus is taught by the prior art, is based on invalid logic (*id.* at 28-31). Appellants contend that the Examiner's rejection is based on an implicit or inherent disclosure of the claimed reboiler temperature in Lashier, Araki or Kreischer, which has not been supported (Reply Br. 6-8, 10-11). Appellants argue that the Examiner cannot rely on the "general conditions" as a basis for optimization because the art does not teach a reboiler temperature (*id.* at 12-13). Appellants further argue that the Examiner's statement that one of ordinary skill in the art would know the appropriate temperature to operate a reboiler is based on official notice and is not supported (*id.* at 8-10).

We have fully considered Appellants' arguments. We find that the preponderance of the evidence favors the Examiner's finding of obviousness. The Examiner's findings may be found on pages 3-11 of the Answer. Contrary to Appellants' arguments, we understand the Examiner's position to be properly based on *In re Aller*, 220 F.2d 454 (CCPA 1955). The Examiner's rejection states that the applied prior art teaches distillation to separate the catalyst system from the olefin oligomer, which one of ordinary skill in the art would have known to include a reboiler that is affected by pressure and temperature, such that one skilled in the art would have determined the temperature of the reboiler in the distillation step through routine experimentation (Ans. 7).

Appellants contend that the Examiner acknowledges that the "general conditions" referred to by the court in *Aller* have not been shown to be met in the instant rejection involving the claimed subject matter. Specifically, Appellants' contend that the "general conditions" include that "the separation comprises a distillation comprising a reboiler and material passed through the reboiler is maintained below about 190°C" and "inhibit[ing] or limit[ing] the decomposition of the deactivated catalyst system during recovery of an olefin oligomerization product" (Reply Br. 12-13). However, the Examiner finds that the distillation steps of Lashier, Araki and Kreischer do use a reboiler (Ans. 3-6). The Examiner finds, and we agree, that one of ordinary skill in the art would have known that distillation with a reboiler is controlled by temperature and pressure. Appellants do not specifically dispute that a reboiler is used during the distillation steps of Lashier, Araki or Kreischer or that temperature and pressure are variables to be controlled in operating the reboiler.

While the Examiner concedes that the prior art does not disclose the product recovery conditions that include the specifics of the distillation process (*id.* at 10), such a concession does not detract from the stated obviousness rejection that is based on routine experimentation of a known reboiler variable (i.e., temperature) to arrive at a temperature for the reboiler within the claimed temperature range. Contrary to Appellants' arguments we do not perceive the Examiner's rejection to be based upon confusion between reaction conditions and product recovery conditions, inherency of the reboiler temperature, invalid logic, or official notice of operating conditions.

Regarding Appellants' argument that Araki teaches away from the claimed reboiler temperature, we agree with the Examiner that Araki's exemplification of particular evaporator temperatures does discourage one of ordinary skill in the art from the claimed range based on Araki's broader disclosure (*id.* at 10-11). Appellants do not respond or contest this finding of the Examiner (Reply Br. *generally*).

Therefore, we determine that the Examiner has established a prima facie case of obviousness with regard to claims 1, 37 and 57. We now consider Appellants' evidence of non-obviousness (e.g., criticality and result-effective variable evidence).

Issue (2)

Appellants contend that the evidence in their Specification demonstrates that the reboiler temperature is a result-effective variable and critical to inhibit or limit decomposition of the catalyst (App. Br. 16-20; Reply Br. 13-16).

The Examiner finds that Appellants' evidence includes only a single alcohol (i.e., 2-ethyl-1-hexanol), which is not commensurate in scope with the claim scope that includes any alcohol (Ans. 8-9). The Examiner finds that Appellants have not shown that the reboiler temperature is a result-effective variable[1] for all the possible alcohols which may be used in the claimed process. *Id.* We agree.

It is well settled that a showing of criticality (i.e, unexpected) results must be commensurate in scope with the claimed invention. *In re Clemens*, 622 F.2d 1029, 1036 (CCPA 1980). Appellants have not shown that the alleged criticality or result-effective nature of the reboiler temperature would occur for a sufficient number of alcohols included in the broadly worded claim language. We note that Appellants have not even alleged that results similar to those achieved with the 2-ethyl-1-hexanol would be achieved for lower chain length alcohols (e.g., methanol or ethanol).

On this record, Appellants' evidence is not commensurate in scope with the claimed subject matter and is not probative of nonobviousness. On this record, we affirm the Examiner's rejection of claims 1, 3-6, 10-13, 15-17, 22, 23, 26, 37, 39, 41-46, 48-50, 52, 54-62, 64, and 65 over Lashier, Araki or Kreischer.

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[1] The Examiner treats the result-effective variable argument in the same manner as Appellants' argument of criticality in the temperature. We agree with such treatment, as Appellants' result-effective variable argument seems to be that Appellants discovered that the temperature of the reboiler is critical or result-effective for inhibiting corrosion and catalyst decomposition.

Issue (3): Claim 18

Appellants argue that claim 18 requires a step of "contacting an alcohol with an adsorbent capable of adsorbing water", which the Examiner has not shown to be taught or suggested by the applied prior art (App. Br. 32).

The Examiner responds that the art teaches using 1-hexanol, 2-hexanol, 3-hexanol, etc. such that "it is not clear how this limitation of contacting the alcohol with an adsorbent capable of adsorbing water distinguishes over the prior art" (Ans. 12). The Examiner finds that the prior art is silent regarding water in the alcohols, so the Examiner posits that water-free alcohols are used (*id.* at 4).

The preponderance of the evidence favors Appellants' argument of nonobviousness. Claim 18 expressly recites a step of "contacting an alcohol with an adsorbent capable of adsorbing water", which the Examiner has not addressed or shown where the applied prior art teaches or suggest such a step. The Examiner has failed to establish a prima facie case of obviousness with regard to claim 18.

On this record, we reverse the § 103 rejection of claims 18, 20, 21, 24, 25, 27-31, 35, 36, 51, 53, and 63 over Lashier, Araki or Kreischer.

DECISION

The Examiner's decision is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136.

ORDER

AFFIRMED-IN-PART

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